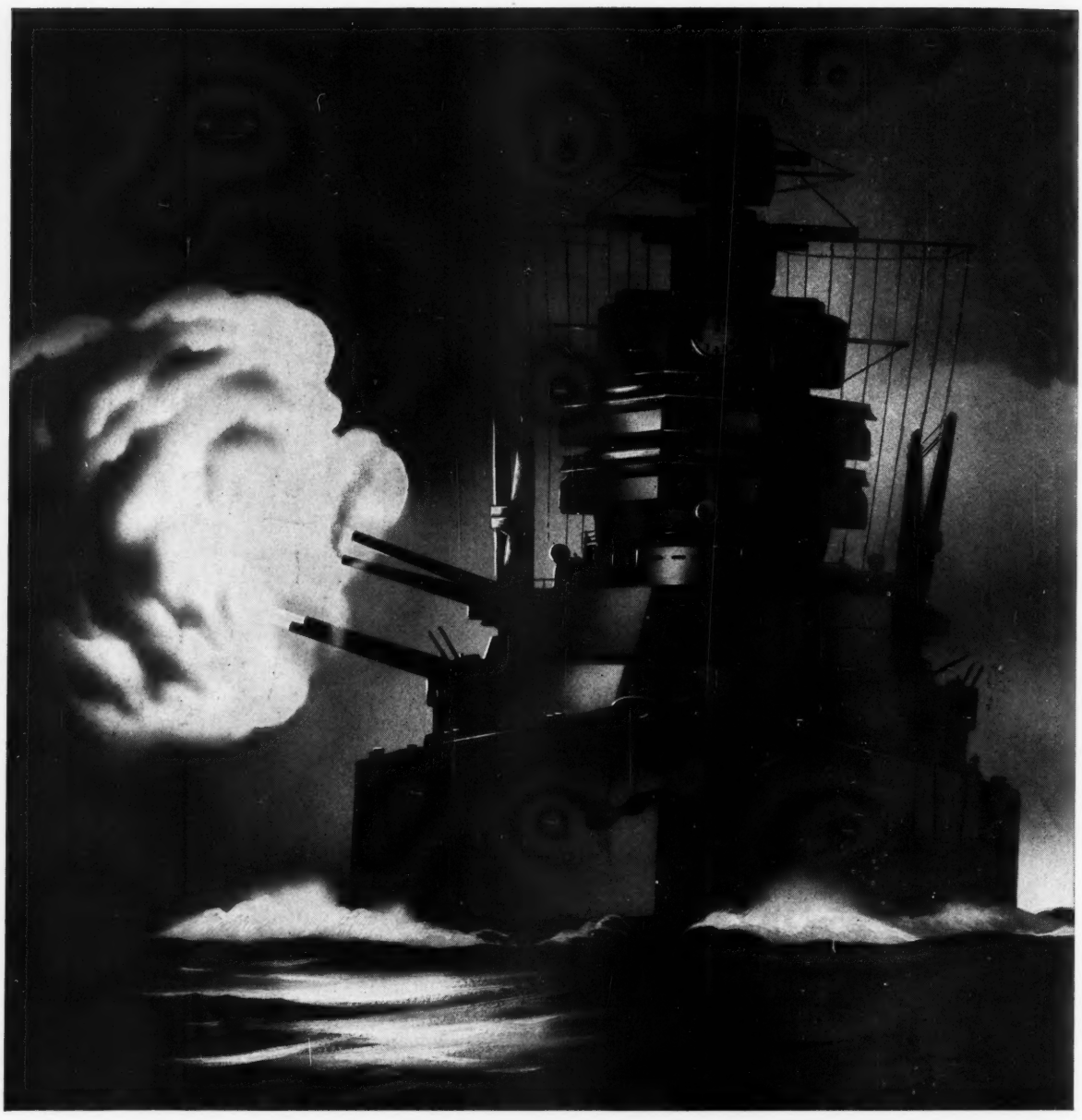
National Bureau of Standards
MAY 19 1942

THE CORNELL ENGINEER

May, 1942
Volume 7—Number 8

COLLEGE OF ENGINEERING · CORNELL UNIVERSITY



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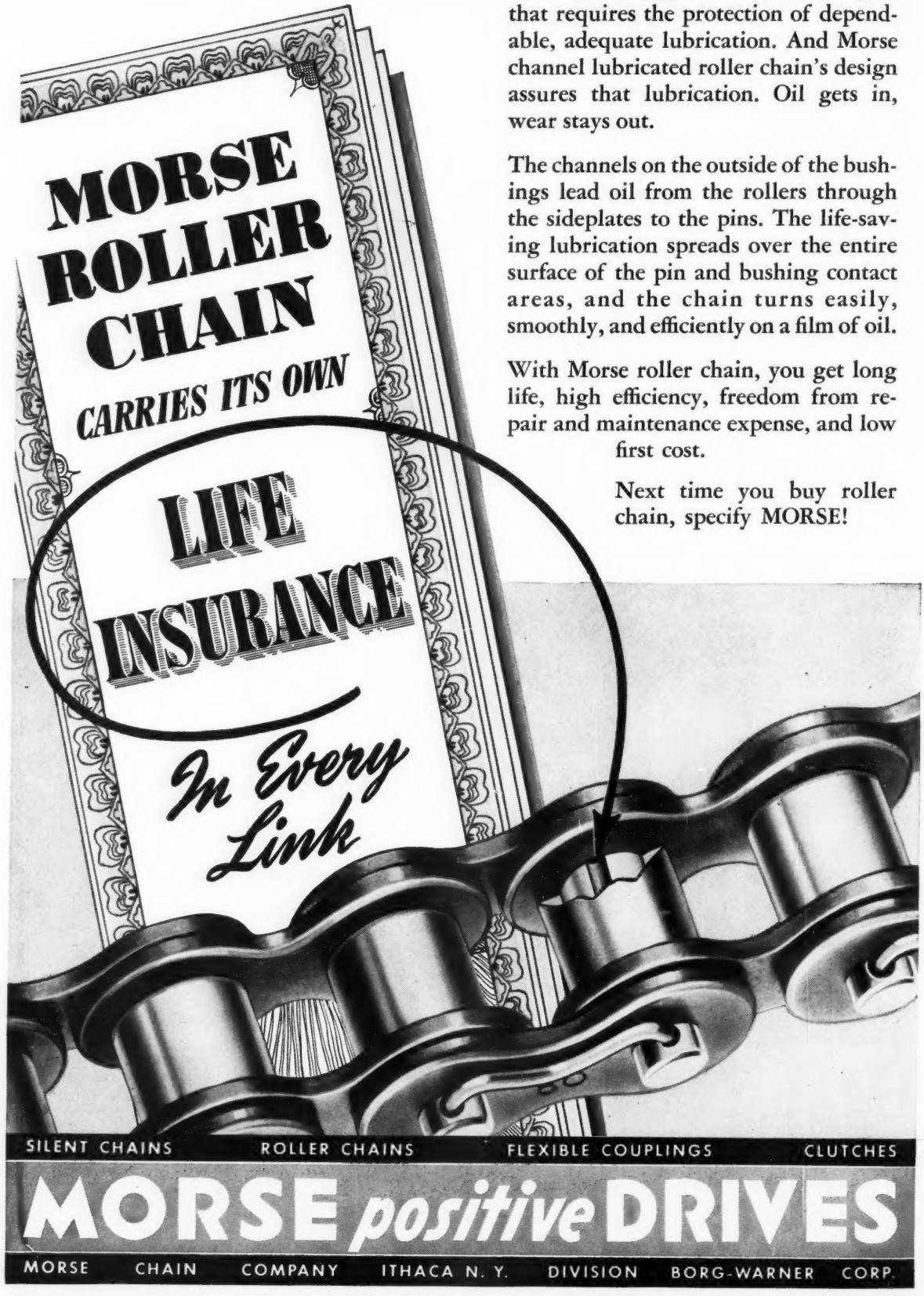

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The CORNELL ENGINEER

Volume 7 | MAY, 1942 | Number 7

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Published monthly—October to May—by the **Cornell Engineer, Inc.**, Ithaca, N. Y. Edited by the undergraduates of the College of Engineering, Cornell University. Entered as second class matter at the Post Office at Ithaca, N. Y., under section 103, Act of October 3, 1917.

Subscription per year: regular $1.50; with membership in the Cornell Society of Engineers $2.00 (See President's page); student $1.00; single copy $.20.

TO OUR READERS:-

THIS issue is the first to be published by the class of 1943. We assume the job wholeheartedly and desire to continue serving our readers with a magazine that truly represents engineering at Cornell. We hope that you, the readers, will feel free to offer suggestions or make contributions at any time; it is your interest that will result in a better magazine.

The policy of the magazine will be to publish articles relating to the engineering profession which are worthy of your attention. In general, the articles will be contributions from alumni, faculty, and students of Cornell, one article from each appearing in every issue. We will also present news of the Engineering College, news of our alumni, personalities on the Hill, and other features of interest. To improve the general appearance of the magazine, we have created a photographic board, the benefits of which will be conspicuous in the near future.

We regret that with this issue we must suspend all subscriptions abroad for the duration of the war. Those who have unexpired subscriptions or new subscriptions will have their balance promptly refunded. Because of the restrictions imposed on all technical publications by the national government, we would no longer be able to keep our publication dates and maintain the technical character of the text were we to continue our foreign subscriptions. We are already restricted and under rigid supervision, and with the future of our country at stake, we feel that this step is not unwisely chosen. We shall, however, be ready to resume our foreign subscriptions at the end of the war.

At this time we want to welcome back on the magazine Mircea R. Sfat, ChemE '43 as our new Assistant Editor. Mike, who was the former editor-in-chief and veteran of four years' service with the publication, will be here next year concluding his five-year course in chemical engineering. To Joe Boyer, Harry Otto, Tom Wilson, John Sullivan, Bill Levings, Ernie Walker, LeRoy Thompson, and Jim Tripp we exend our congraulations for a fine performance. We are proud to have their names added to the long roll of Cornellians who have served on **The Cornell Engineer.**

—THE EDITORS

REAL PROPERTY AND ITS MEASUREMENT

By PROFESSOR R. Y. THATCHER, C.E. '09

PRIVATE ownership of land has been called a cornerstone of our modern civilization, and is usually accepted without question as one of our inherent and inalienable rights, one of the principles of our political economy, and a right protected by our laws and our constitutions. No property rights are given a higher degree of protection by the courts than is given to the rights in land. The name "real property" is not without meaning. Although in general a man's real property is his own to use as he wishes, this ownership is not so absolute as it may appear to be and is subject to many limitations and qualifications.

For example, under the law of eminent domain a sovereign power has the right to take privately owned land, upon payment of a fair price, if it is required for some beneficial public use. This legal right is vested in the federal government, in the various state governments, and in public and private corporations to which such right has been delegated by their charters.

A landowner may actually lose his title by adverse possession, if he fails to protect his rights as against another person who for a statutory number of years has occupied the land and put it to beneficial use. In a similar manner, other parties may gain an easement by prescription, if the owner for a stated period does not object to their making use of the land. Common examples are public travel by roadway or footpath across the land, and the stringing of wires above the land or the construction of pipe lines under it.

Under the common law doctrine of riparian rights, each landowner has exclusive right to non-flowing surface and subterranean waters within the limits of his boundaries; he also has a correlative right, subject to the equal rights of all other riparian owners on the stream, to any flowing waters above or below the surface. In many western states, however, where water is scarce and has great economic importance, the older riparian law has been abrogated by statute; under the rule of prior appropriation, the State has assumed rather complete jurisdiction of water resources, on the theory that the right to make use of water should be under the control of the State, which will administer it in the public interest by means of grants to applicants—whether they are riparian owners or not — in order of their priority and upon evidence that the proposed use is a beneficial one and for the best interests of society

It was formerly held that the right and title to land extended below it to the center of the earth and above it to the sky. Modern mining statutes have tended to modify and limit underground rights; and since the advent of aviation the courts have pointed out that "to the sky" means to a reasonable height. Some recent cases have held that planes cannot be considered as trespassing or causing a nuisance if they are more than 500 feet above the ground.

Finally, there are in most jurisdictions laws to regulate the location, kind, and size of buildings or other structures which a property owner may choose to erect on his land; also, such laws prohibiting him from so using his land as to constitute an interference with or infringement upon the equal rights and privileges of adjoining owners.

History of Rights and Obligations

In considering the whole subject of the rights in land and the limitations which society, through its laws, has imposed upon the ownership of land, we are reminded of the fundamental philosophy that the possession of any right or privilege usually carries with it a corresponding duty or obligation. This combination of right and obligation will be better understood

THE AUTHOR

AFTER graduating from Cornell with a C.E. degree in 1909, Prof. Thatcher spent six years in railroad engineering for N. Y. C. R. R.; three years on the Federal valuation of railways with the Interstate Commerce Commission at Washington; and for six years was in charge of civil engineering work at the Lackawanna Plant of Bethlehem Steel Co. In 1924 he returned to Cornell where he has taught various civil engineering subjects and is now teaching all the engineering law courses.

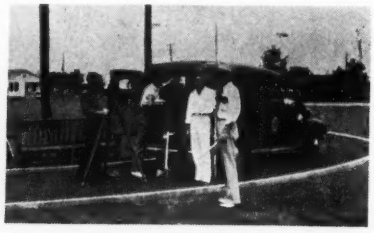
if we go back in history to the beginnings of what we now call the estates in land.

Blackstone, the eminent English jurist whose Commentaries written in 1769 continued for the following century to be the foundation of all legal education in America, stated therein: "There is nothing which so generally strikes the imagination, and engages the affections of mankind as the right of real property, that sole dominion which one man exercises in exclusion of the right of any other individual to a determinate spot of ground. When the law is to be considered not only as a matter of practice, but also as a rational science, it cannot be improper or useless for us to examine more deeply the rudiments and grounds of these positive constitutions of society."

According to these Commentaries, the so-called feudal system of land ownership is based upon the fact that throughout all history, conquering nations such as the Romans, the Goths, the Huns, and the Normans, as a military policy, proceeded to allot the occupied lands to the superior officers of the army, who in turn dealt them out in smaller parcels to the inferior officers and most deserving soldiers. These allotments were called feuds or fees, which words signified a conditional stipend or reward. The condition annexed to them was that the possessor should do faithful service, both at home and in the wars, to him by whom they were given, for which purpose an oath of fealty had to be taken, for breach of which the lands were forfeited. This feudal system was developed throughout the countries of Europe, particularly in England by the Norman barons after the Conquest. By common consent of the English nation, it was agreed that "The king is the universal lord and original proprietor of all lands in his kingdom; no man doth possess any part of it but by a gift from him, to be held upon feudal service."

Originally these feuds or titles were inalienable, that is to say the land could not be sold nor even devised by will without the consent of the lord; but after Magna Charta, and with the waning power of the king and his nobles, feuds or fees began to be more freely bought and sold, and what corresponds to our modern laws of tenure and succession gradually developed. The feudal system then came to be considered as a civil establishment, rather than as a military plan. No longer was military service exacted as compensation for the privilege of owning land, although for many centuries the king still retained certain prerogatives in privately owned land. For instance, to the king, not to the owner of the land, belonged all precious metals found under the ground. To the king also belonged certain tall trees that might be used for masts in his majesty's ships.

In the light of history, therefore, it is easier to understand our modern conception that title to land is a privileged as well as a right, and that this title is reduced, qualified by, and subject to the superior right of the state to insist that the land be used, under certain circumstances, for the benefit of and in the interests of general public welfare.



Jacksonville surveyors of twenty-five years ago, and a field party in the same city today.

Establishment of Modern Title

Because of the importance attached to the ownership of land and the fact that the greater part of the nation's wealth is in the form of real property, it becomes necessary to assure to each owner his clear, unquestioned title, and to ascertain correctly and exactly his boundary lines. This requires the collaboration of the lawyer or title examiner and the civil engineer or land surveyor in the proper identification and description of the parcel to the satisfaction of all parties, and in the proper marking on the ground of the boundary lines so established. Thus existing ownership is confirmed and perfected, and the transfer of title is facilitated in case one owner wishes to sell to another.

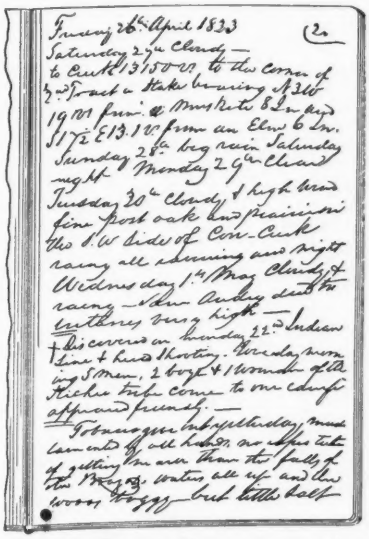
It is not the purpose of this article to discuss the duties of the title examiner in looking into the history of the title nor those of the attorney who attends to the legal details of defending or transferring title. Nor are we greatly concerned with the describing and surveying of *new* boundary lines, such as those made necessary when a larger tract is subdivided into smaller parcels, since this as a rule presents no serious problems. The most difficult and at the same time the most interesting task is that of the land surveyor who is called upon to determine and identify on the ground the property lines described in existing deeds—especially where the location of these lines is in doubt because of inaccurate and ambiguous descriptions or because essential corner markers have been permanently or temporarily lost. Frequently, there is a difference of opinion on the part of the adjoining owners as to the correct location of their common boundary, and hence conflicting claims to a certain strip of land arise.

Human nature seems to be so constituted that neighbors who are quite willing to adjust their other differences in an amicable spirit are likely to contend bitterly about their boundary lines, and they often insist upon carrying the case into the courts at an ultimate cost quite out of proportion to the value of the land involved. As the surveyor plays a leading role in the effort of all parties to resolve their differences, it is particularly important for him to exercise all the skill, knowledge, and judgment that he can bring to bear on the problem. He must, for example, be thoroughly grounded in such legal rules as those relating to ad-

verse possession, prescription, trespass, accretion, the distribution of shortages or surpluses, the significance of monuments, and the many other rules known as the laws of boundaries. It is assumed of course that he has and uses the requisite technical skill in taking measurements, reading angles, and making the necessary computations. Above all, he must use good judgment in the light of all the facts to be discovered about the property, and based upon his own past experience and that of other land surveyors. Very often he finds that the exercise of judgment and sound common sense is more useful that the mere technique of measurement in arriving at the correct answer, or at least the best answer, to the problem with which he is confronted.

Although the party who has employed the surveyor may expect him to find the facts about the property in favor of his employer, the only interest of the land surveyor should be in finding the facts. His duties do not require him to become an advocate of his principal. If the facts found are not sufficient or are conflicting, he should so report and leave to the courts the settlement of ownership and boundaries, assuming that the contending parties are unable to settle the matter out of court. In many cases, however, the surveyor can best serve the interest of his client by suggesting a reasonable location of a doubtful line and advising that the two owners agree upon the this location. Such an agreement is binding even though it is merely a verbal one between the parties; it is much better and more likely to be perpetuated and binding upon subsequent parties, however, if a proper written agreement is executed that clearly and definitely describes the line decided upon and monumented on the ground. It should be remembered that the engineer's survey, no matter how carefully or correctly made, does not in itself establish a boundary line. The line so surveyed does not become a legal boundary unless and until the result has been accepted by all parties whose interest is affected. or there has been a court decree that the survey represents the proper solution of the problem involved.

One of the most serious situations occurs when the survey discloses the fact that the building of one party encroaches upon the land of another, either because of past uncertainty as to where the boundary line was located or be-



A page from a Texas surveyor's notebook of 1832

cause the building was erected without taking the trouble to ascertain just where the property line was. Unless the land so occupied has been lost by adverse possession, the usual remedy of the party whose land has been encroached upon is to require either that the building be removed or that the necessary strip of land be purchased from him at the price he may set. One owner in New York City a few years ago was obliged to pay $50,000 for a strip of land six inches wide, because his building was found to extend that far on adjoining property. It was pointed out at the time that this sum was less than the cost of removing the building but that an accurate survey would have saved both trouble and expense.

Finding the Monuments

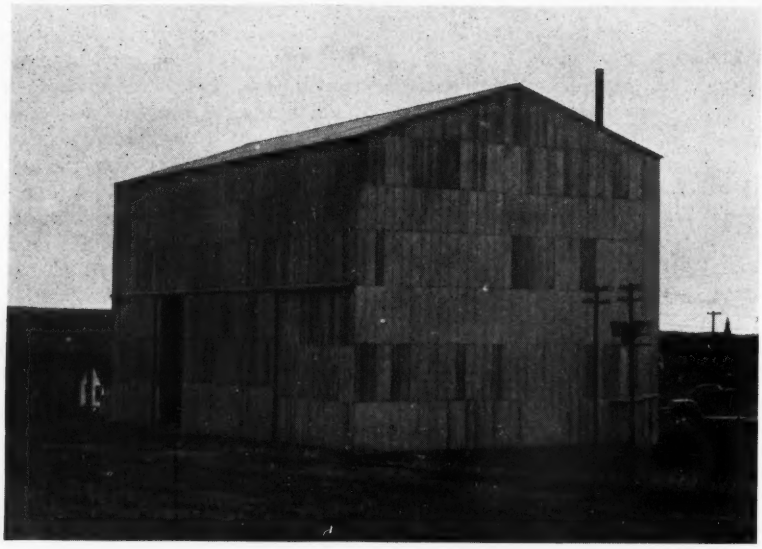
Both from the standpoint of law and as a matter of engineering procedure, it is an axiom that anyone who seeks to retrace an original survey must follow in the footsteps of the original surveyor. This means that he must find the old corners as marked or monumented and that he must connect them by straight, curved, or irregular lines, as called for by the deed, so as to follow the boundaries previously established.

It will be seen at once that the surveyor's principal task is to find and identify the old monuments; the word "monument" refers to any sort of corner marker, whether a natural or an artificial one, as well as to any physical feature that marks the line itself, such as a stone wall, a fence, the thread of a stream, the center of a highway or even the land of an adjoining owner. Having once satisfied himself that he has found the proper original monuments, the rest of the survey is a comparatively simple matter. But many times in the experience of every land surveyor he finds that the search for old monuments requires all the skill, ingenuity, perseverance and hard work of which he is capable, and there is a corresponding thrill when his efforts are finally crowned with success.

The most important monument obviously is that which marks the point of beginning, as without it the surveyor will not get very far in identifying and measuring the particular parcel. It is therefore most important that the point of beginning be carefully described in the deed. A rather startling wording was recently quoted by a Florida land surveyor who successfully retraced a deed which specified: "Beginning at a cabbage in a hammock; thence west 98 chs. to Pride of Egypt; . . ." This is somewhat mystifying until we are told that in the local language a cabbage is a species of palm tree, a hammock is a small hill covered with dense undergrowth, and Pride of Egypt is another kind of tree.

Frequently the search for a missing monument is complicated by the fact that the land has since been filled in so that the marker lies at an unknown distance below the present surface. Here a pick and shovel are in order, and the surveyor is fortunate if he has some idea of just where to dig. Some years ago, in surveying a large tract that was to be developed for industrial purposes the writer spent some time in excavating

(*Continued on page* 20)



Exterior view of the laboratory

THE NEW HIGH VOLTAGE RESEARCH LABORATORY

By PROFESSOR R. W. AGER

THE new High Voltage Research Laboratory is now approaching completion. The building is finished except for a few minor details. Much of the equipment has been delivered and the installation and wiring of that equipment is progressing satisfactorily, although there is still much to be done.

The laboratory is located at 921 East Mitchell Street just outside the Ithaca City limits. It is not on the campus proper but is within a few minutes' drive. This location was chosen mainly because of the need for an open level stretch of ground for transmission line experiments. Good transportation facilities were also desired. In selecting this site both these requirements have been met. A railroad line used to lead south from the East Ithaca station of the Lehigh Valley Railroad. Below Mitchell Street this right-of-way was abandoned and the ties and rails removed several years ago. This old right-of-way now supplies the need for a transmission line location, while a short extension of the rails has carried the tracks into the building and right across the test floor area. Already several freight cars have been brought into the laboratory for unloading.

The building has a structural steel frame. The outside is covered with galvanized, corrugated iron, both sides and roof, and is heat insulated with one-inch-thick insulating board. The building is 122 feet long, 68 feet wide and 71 feet high. There are only three small windows in the building, and these are located in the offices and shop. No windows are provided for the main room where artificial light is used exclusively. Some experiments must be performed in total darkness and it is better to have a room without windows than to go to the trouble and expense of providing really light-tight coverings. There are four doors into the building. Two of these are normal size. The smaller of the other two is 28 feet wide and 23 feet high. This is the door through which the rail road enters the building. There is ample clearance all around the ordinary freight car or locomotive. The largest door is 60 feet wide and 30 feet high. This one opens out onto the old railroad right-of-way where the transmission line experiments will be made. Large clearances are required around the

THE AUTHOR

PROFESSOR Ager has had wide experience in high voltage transmission work. After graduating in 1922 from the California Institute of Technology, he worked for the City of Los Angeles and then for the Southern California Edison Company, where he inspected insulators for high voltage lines. As a result of his experience in this field, he was put in charge of research on insulators in the Edison Company's million volt laboratory in Southern California. After eight years there, Professor Ager went back to study for his doctor's degree, which he received in 1932. Since then he has taught at the Universities of Texas and California and recently has worked on defense machinery for the General Electric Company.

Professor Ager is a charter member of Tau Beta Pi at the California Institute of Technology, an associate member of Eta Kappa Nu, and a member of Sigma Xi, national scientific honor society.

conductors which will lead from the inside of the laboratory to the test spans.

There are a few small rooms and one large one in the building. The power room contains the motor generator sets, the circuit breakers, and the regulating equipment for the 60 cycle power. In the furnace room is located the boiler and automatic stoker used for heating the building. The shop has been equipped with a lathe, drill press, grinder, and a fairly complete set of hand tools. A small office has been provided adjoining which is a photographic dark room. It is expected that many of the readings and observations will be made photographically, and, while the dark room equipment will be very limited, it will find a great deal of use. The control room contains the control desks, instrument panels, and measuring equipment, including a high-speed cathode-ray oscillograph.

The main room occupies over 90 percent of the volume of the building. Here are located the main pieces of high voltage equipment. The three high voltage transformers are located at one end of the room. These will supply three-phase, sixty-cycle power at pressures up to 433,000 volts, while by reconnection, single-phase power at voltages up to 750,000 between line and ground will be available. Some idea of what this means may be had from the fact that this voltage will jump a point gap of almost ten feet, and the arc so formed may be drawn out to 30 or 40 feet before it will break.

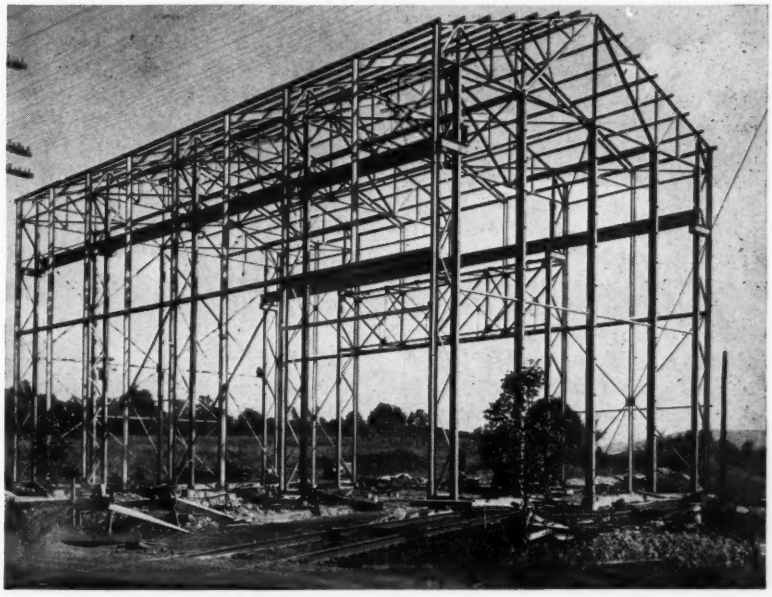
At the other end of the room is an impulse generator. This equipment generates "artificial lightning." The maximum voltage available is 3,000,000 and the top of the structure, which is about as high as a three story dwelling, must have a clearance to all grounded objects of at least 25 feet. Arcs 20 feet long and lasting only a few millionths of a second may be obtained from this equipment. The noise accompanying such an arc is similar to the firing of a shotgun. The destructive power of these lightning bolts may be demonstrated by the splitting of four-inch hardwood timbers.

The impulse generator takes energy from a controlled low-voltage power supply. This energy is passed through a transformer and vacuum tube rectifier where it is converted to direct current at voltages up to 100,000. Thirty capacitors of one-fourth microfarad each are charged at this voltage. An automatic switching arrangement is used which, upon the pressing of a button, connects these capacitors in series producing a surge of 30 x 100,000 or 3,000,000 volts.

With such voltages used in regular testing a great deal of attention must be paid to safety. All operating will normally be done from the control room which is thoroughly shielded by an enclosing copper screen. Large wire-reinforced plate-glass windows permit the entire test floor to be seen by the operator. Safety interlocks are used on the only door not visible from the control room. The controls have been made simple and easy with all safeguards in operation. Every attempt has been made to have the use of the safety features natural. But even with all the care possible incorporated into the design, the final safety controls must be in the minds of those men who operate the equipment.

The laboratory will be used almost exclusively for research work. No present plans indicate its use for class instruction. Much work has already been tentatively outlined in connection with the companies sponsoring the laboratory. Several other companies have indicated their desires to have special work done. With all this work in prospect it appears that the continuous use of the laboratory is assured for several years at least. It seems quite possible that additional help will be required in the near future.

One question usually asked regarding the laboratory concerns radio interference. The steel frame and the corrugated iron sheathing have been bonded together to make the building a shield. This should keep any disturbance which might be set up inside the building from getting outside and causing troubles with radios. Considerable thought has been given to this point and we expect little if any trouble even in the immediate neighborhood.



Steel framework of the laboratory

Cornell has reason to be proud of this laboratory. No other Eastern University has equipment of this type which can equal that found here. There are a few laboratories having equal or better facilities but these are few indeed. It is hoped that, with this laboratory, Cornell will assume a leading role in high voltage research.

DESTROYERS -- WORLD WAR II

By H. F. FERRY, JR., ME '44

TO ANY boat-lover of distinctive taste and a yen for the Jules Verne brand of philosophy, the sight of one of Uncle Sam's new destroyers would be a tremendous thrill and a reassuring proof that our ship designers are still top-notch. This World War II model is the sleekest warcraft on the high seas today. Its contours are stream-lined from every angle. Its broadside features would put any of the last war's vintage to shame. Gone is the day of the famous four stacks which adorned the super-structure; in their place is one thin, squat vent which nestles down neatly and inconspicuously. Its long, trim hull is beautifully fashioned; its surfaces, unblemished by rivet heads; its prow, gently sloping but deadly sharp. It is probably one of the most maneuverable and effective warcrafts afloat for the amount of armament it carries. When it emerges from the Navy yards smeared in its war paint, there is nothing that looks more truculent —the smallest in the fleet except the submarine but the most malicious.

These few impressions might strike an inspired observer upon first glimpsing such a craft. But to the builder of these destroyers there is much more to the answer as to why they are so outstanding. One of the most significant characteristics of these salt-cured daredevils is their excessive armament. In the days of yore when the old four-stackers plowed the seas, their four-inch guns belched fiery defiance. Now, instead, much heavier barrels guard the decks—and in a much more efficient manner. Their bomb-splinter proof, automatically turned turrets enable the crew to operate the guns quickly, unharrassed. Loading is facilitated by belt conveyors starting from powder rooms deep in the hull and ending up inside the hooded guns. The firing position of these rifles is determined in the communications room in the fore super-structure and relayed by telephone. So with a goodly number of these big barrels at the fore and aft, these ships present a formidable broadside to any challenger.

In addition to these guns, several sets of multiple torpedo tubes rest on the main deck ready to spew their salvoes into the water from either side. Above the tubes amidships, poised in the clear for immediate action, are heavy calibre machine-guns, while the ones abaft mark the start of a depth bomb track down which enormous charges are gently —very gently—rolled off the stern. No more of those dangerous Y-guns of the last decade which used to fire explosives simultaneously out of forked muzzles. These depth bomb charges are cantankerous and must be handled carefully. Their insides are packed with enough powder to crush anything under water within a 200-yard radius. Various other warring devices bristle on the fore and aft superstructures—machine guns, powerful searchlights, all but the good old belaying pin. While out from a secretive vent in the aft may exhume the all enshrouding pall of a smoke screen quickly generated by furnaces below. These, then, are the offensive weapons which give this craft its striking power.

One of the most fascinating defensive weapons employed may be found in the under-water sound room where, with the aid of listening devices and sounding rods, the exact position of submarines is computed. By using a new technique these under-water denizens are accurately spotted even with dead motors. Another device known as the Degaussing System provides for the demagnetization of the entire hull, thus completely eliminating the menace of magnetic mines, which caused such a sensation last year in the English Channel. There have been various schemes tried for camouflage, too. The new blue-black battle make-up adopted at the beginning of the present war is perhaps, the best protective means this destroyer has of concealing itself. Black, of course, absorbs most of the light striking it and reflects little. Both in day and night operations this is a distinct advantage. It is interesting to note in

this connection that the official war paint for the Navy has with each successive period become more besmudged. Starting with white it soon dulled to dirty grey during the last war, and now, finally, it has turned the symbolic color of the Navy's death-dealing role. Clever and imaginative minds have even conceived the idea of painting white breakers on the prow of the ship as a means of confusing the enemy. Simple mathematics will readily determine a ship's speed, but these artificial waves do offer much confusion and may even cause errors. Another ingenious stunt has been the installation of false smoke stacks. Of course, when a ship is relatively near, its identity may be discovered easily. But suspicious craft in the distance may often pass unmolested because of mistaken outline. Our destroyers of the last war carried four funnels which became quickly recognizable by the enemy.

Another distinguishing feature of these new boats is the degree to which all interior space has been utilized efficiently. There is literally not one square inch of dead floor space anywhere. The boiler and engine rooms are the only places where really adequate standing room is available in the hold. In the fore are bee-hived sections of powder, various stores and ordinance, bo'sun's supplies, and chain lockers for the anchor chains—none of which would be ample for scratching room. In many places it is necessary to stoop. The mid sections are composed mainly of engine and boiler rooms with the crew's and officers' quarters above. In the aft are chemical supply cubicles, storage space, instrument and torpedo lockers, and small maintenance shops. The fuel tanks lie, of course, on the bottom of the boat, acting partially as ballast. While the compartments are all as small as possible, there is no such case as in the submarine where the crew's bunks have been draped over torpedoes or sandwiched in between a pair of steam pipes. In fact, the designers really must have had pity for the personnel when they fashioned these quarters and mess-rooms. The captain's and commanding officers' places are, of course, above deck, garnished in the traditional Navy splendor but none too roomy. The crew and lower officers eat and sleep in clean, well-ventilated, well-illuminated compartments below. Everything has been perfectly proportioned; no space has been wasted. There is hardly room for the mascot.

Of course, minimum space means less net weight which in turn means more speed for a given power unit. However, the creators thought not only of reducing weight to a conventional minimum but of actually cutting it down to practically nothing. As a result, these new models, though displacing 2000 tons, weigh less than they ordinarily should. No armor plate is used on the exterior, and only thin galvanized steel is used for the hull covering, or "skin". The bulkheads, cross-heads, are also very light and all perforated to further reduce weight. Is it any wonder that they are called "tin cans"? There may be some explanation of this sacrifice of protective armor for increased speed. Speed is essential in any warcraft, since maneuverability is very often largely responsible for success or defeat. Any legitimate way of increasing speed is always welcomed. A very large increase may be obtained by reducing the hull weight, or slicing down the "skin" thickness. The designers have done just this thing, evidently feeling that a destroyer struck by a torpedo or a screw-action shell would be a hopeless case, anyway, and that at best the projectile might, if the "skin" was thin enough, slip through both sides, thus rendering only minor internal damage. The holes would be quickly covered up by dropping canvass sheets called "crash pans" around the hull's exterior. Repairs could then proceed rapidly.

However, despite this seemingly hazardous structural feature, these boats are sturdy and move along at an incredible speed. Two surprisingly small but powerful steam turbines, each turning oppositely, generate the torque for each of the twin-screw propellors. Most massive of the propulsion machinery is the reduction gear which allows economical speeds for the prime-mover while transmitting a large amount of power to a comparatively slow-moving propeller shaft. Probably the greatest advantage gained by using these small, high-speed turbines is the degree of suddenness with which starting and stopping can be performed. The maneuverability is greatly improved since the ship can be thrown into a quick reverse. This is exactly what is done, as a matter of fact, during trial runs. Among other tests, a "crash stop" is given every boat before it is commissioned in the Navy. A full speed ahead throttle is thrown into full speed astern and the results carefully observed. The fact that most of them survive these terrific, artificially-induced strains gives merit to the structural strength of the hull despite its thinness.

Another quality which, perhaps, is less connected with speed than beauty is the flush, smooth welding seams on the exterior instead of the usual ugly, riveted lap joints. The development of electric welding has completely revolutionized hull fabrication as well as improved the appearance of hulls. Whereas, in previous times, an elaborate system of scaffolding was necessary for riveters, welders now work on whole sections on the ground. These completed parts are assembled together on the hull structure. Bow sections are separately constructed, then combined with each other, and the whole prow finally added to the fore of the ship in one piece. This process, along with the new welding technique, has speeded up production greatly. From a purely aesthetic point of view, though, the great advantage with welding has been to bring out the beautifully fashioned contours of the hull.

In conclusion, I might add that the production of these destroyers has increased tremendously. Plans are being standardized so that the purchasing and cataloguing of materials and the fabricating of hulls is all vastly simplified. At the time I was working in one yard last summer they were building three different types of destroyers. When I left they had reduced the number to two. Changes were coming in from the Navy so rapidly that shortly after I had gone one standard pattern was being used.

AROUND THE COLLEGE . . .

Engineer's Dinner

THE annual Engineers' Dinner was held last April 21 in Willard Straight Hall. Mr. S. D. Kirkpatrick, president of the American Institute of Chemical Engineers, addressed the group, and an announcement of the awards and honors presented to engineering students for the current year was made by Dean S. C. Hollister.

Awards were made as follows:

In the Sibley Prize group, William H. Sens, ME '43, was first; Dean B. Wheeler, EE '43, second; Harry J. Lipkin, EE '42, third; Donald L. Johnson, EE '43, fourth; and Lowell J. Pierce, ME '43, fifth.

The Kappa Tau Chi award was presented to Wilbur O. Gundlach, AE '45; Ralph Bolgiano Jr., EE '44, received the Eta Kappa Nu award; Atmos presented its award to George W. Bishop, ME '44; David W. Milhan, CE '42, received the Fuertes Medal award; and the Keuffel and Esser Company made its award to William W. Mendenhall Jr., CE '45.

The following sophomores received the book awards of the Cornell Society of Engineers: Wallace H. Toole and M. James Stooker, Chemical Engineers; William B Correll and Allan W. Trimpi, Civil Engineers; Ralph Bolgiano Jr., and Robert S. Rochlin, Electrical Engineers; and Franklin K. Moore and Raymond A. Van Sweringer Jr., Mechanical Engineers.

The Fuertes Memorial Prizes in Public Speaking were received by the following men: Harvey E. Schock, AE '42, was awarded first place for his speech, "Spot Welding, Rather than Riveting"; George B. Marchev, AE '43, was awarded second place for his speech, "Radial versus Inline Aircraft Engines"; Albert J. Mangones, Arch '42, was awarded third for his speech "Architecture in the Present World Situation"; Robert E. Hutton, EE '43, received honorable mention; and the other finalists were Harry E. Otto, AE '42, Richard A. Graham, ME '42, and Donald R. Goodkind, CE '42.

The speaker at the dinner, Mr. S. D. Kirkpatrick, is the editor of Chemical and Metallurgical Engineering magazine. For the past several years he has been active in the Engineers' Council for Professional Development and the Committee on Professional Training, both of which are general engineering organizations representing the membership of all the various engineering societies.

Award of Fuertes Memorial Prize to Harvey E. Shock, '42

Mr. Kirkpatrick was graduated in chemical engineering from the University of Illinois in 1916, served as a lieutenant in the Water Supply Services in the American Expeditionary Forces, and in 1919 was a technical advisor to the American Commission to Negotiate Peace.

For the past twenty years he has been connected with the McGraw-Hill Publishing Company, Incorporated, and he is a director of that concern. He assumed his present editorial position in 1928.

Approximately 300 students and faculty members of the College of Engineering attended the dinner.

Kennedy Addresses Boards

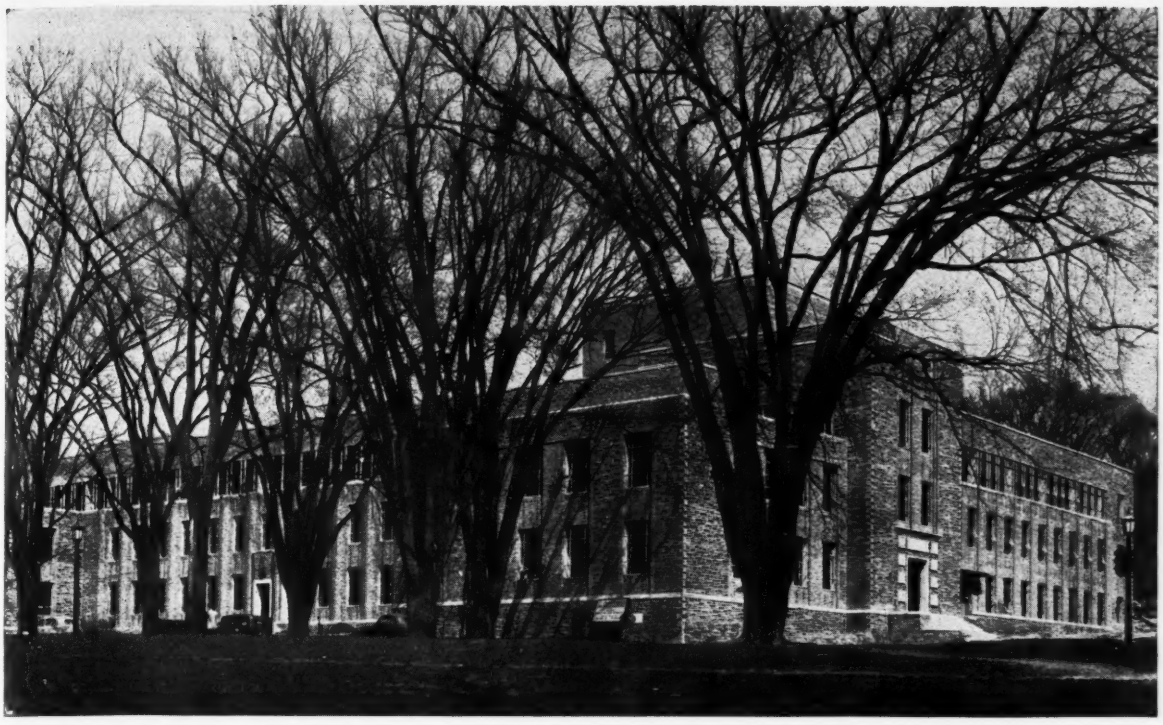
THE CORNELL ENGINEER held its annual banquet, complete from soup to the 'Alma Mater', on Friday, April 13. At that time announcement of the board elections was made and board members and guests were addressed by Mr. W. E. Kennedy, M.E. '12.

Mr. Kennedy spoke of the many highlights and thrills found by one inoculated with the "ink bug." He also spoke of some interesting facts about the work which business publications do in normal and war times. His speech ran along the following lines.

A large number of today's successful business publications are headed by graduate engineers, and this opens an excellent field for those interested in the publishing profession. Practically all branches of business and industry have individual publications. Doctors, printers, druggists, engineers, jewelers, and many others have their trade journals.

These publications serve a definite purpose. They may contain on-the-spot news concerning the trade; they may serve to depict and direct the development of industry; they may predict financial trends in the industry; and they may promote the industry served.

At the present time many pub-



THE editors of the latest "Who's Who in America" have selected the gift of Olin Hall by Franklin W. Olin '86, as one of the six outstanding gifts to educational institutions during 1940 and 1941.

"As a memorial everlasting to a son who died twenty-two years ago," the editors say, "Olin Hall of Chemical Engineering, the new building which Cornell University, Ithaca, New York, will receive as the result of a gift of $700,000 from Franklin W. Olin, through the Olin Foundation, is emblematic of commemorative educational philanthropy, and as well materially outstanding, since it is equivalent to 1.4 per cent of the recipient institution's comparatively large combined endowment capital, plant, and equipment. The donor-father is a successful engineer, industrial equipment designer, and business man, president of the Western Cartridge Company of East Alton, Illinois, and other corporations."

Olin Hall will be in partial operation during the coming summer and will be in full operation when the September term begins.

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lications are carrying on extensive campaigns to familiarize the industry they serve with new manufacturing methods and processes vital to war production. Many publications are doing excellent work along this line and are being praised both by industry and the government.

These special publications also have their business side. There are five business magazines that print more advertising pages a year than any of the magazines with more general appeal. Advertisements are also doing their share in the war effort. Manufacturers who are unable to supply their customers with the desired equipment are running advertisements which tell how to make old equipment do the job.

Mr. Kennedy closed by saying that we will inevitably win the war. He emphasized the tremendous progress that has been made in production and he stated that by fall our problem will not be production but will be transportation of the manufactured material to the front.

Ordnance Training

A GROUP of twenty-two Government employees, sent to Cornell University by the Civil Service and the Rochester Ordnance District of the United States Army for special training as ordnance inspectors, have completed their 12-week course. A second group of 55 are now in residence. Other larger groups are expected to take the course later.

The course is in charge of Professor S. S. Garrett, assisted by Professors E. H. Carruthers, S. F. Cleary, J. O. Jeffrey, and J. R. Moynihan, Emeritus Professor A. E. Wells, and J. D. Grant, H. J. King, M. W. Lee, L. J. Pierce, and A. J. Sait.

The 12-week course includes 480 hours in class rooms, laboratory, and plant inspections, and about 150 hours in unsupervised study. Laboratory exercises are designed to develop skill in making hardness tests and in working with precision instruments. The remainder of the time is taken up by a review of mathematics and rapid courses in blue print reading, sketching, manufacturing processes, and in inspection methods. Plant inspection trips are also made.

Training For Bombardment

How to protect Buffalo's industrial plants, transportation facilities, public utilities, and other vital in-

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Treasurer Tripp

James G. Tripp, Jr.

ONE of the more outstanding senior civil engineers is THE CORNELL ENGINEER's treasurer, Jim Tripp. In addition to his work on this magazine, Jim has been active in athletics and in campus and fraternity activities.

Jim's childhood was quite an unusual one, because he never lived in one place very long. Jim was born in Los Angeles in 1920, but soon afterward, because of his father's business, the Tripp family moved. Ever since then they have moved every few years. Jim has lived in almost every section of the country from Florida to Maine, and from California to New York. He has been in all but four of the forty-eight states and hopes someday to complete his record.

Jim is following his father's foosteps in choosing a career of civil engineering. In traveling about the country he had an opportunity to talk to the alumni of various universities. It was the enthusiasm of the Cornell men for their alma mater that caused Jim to decide to come to Cornell.

During his frosh year, Jim won his numerals in lacrosse. As a sophomore, he placed second in the competition for track manager and was elected to the board of THE CORNELL ENGINEER. He was also on the Freshman Advisory Committee.

By the end of his junior year, Jim had been elected to Pyramid, Quill and Dagger, and Red Key, all senior honorary societies.

During each summer since entering Cornell, Jim has worked in construction companies. After his freshman year, he worked in New York City designing floor beams. Two summers ago he did drafting, designing, and surveying work on the Green Mountain Dam in Colorado. Last summer he worked in the same construction office as Professors Jenkins, Thatcher and Stanley in the building of an Army cantonment in Indiana.

At the end of his sophomore year, Jim completed the advanced R.O.T.C. course in infantry, after having three years of R.O.T.C. at Valley Forge. In the middle of February he received orders to report for active duty, but he was deferred until after graduation. After doing his bit to win the war, Jim hopes to enter his father's construction company.

John B. Sullivan

WE have in John Sullivan one of those extraordinary persons who has the distinction of having both an Arts degree and, in May, an Engineering degree. In 1936, he enrolled in the Arts College as a physics major. During his period as an undergraduate, he found that his interest lay with the applied rather than the theoretical branch of physics. Realizing the value of his cultural training, and the lack of it in engineers in general, he felt that by securing additional training in engineering he would be better qualified to provide for himself when he finished school. So in 1940, after receiving an AB degree from the Arts College, he enrolled in the School of Electrical Engineering from which he will be graduated in May.

Sully hails from Rochester. His dad, an ME from Cornell, talked Cornell to him ever since he can remember, so it was the logical school for him to choose.

In his frosh year, he earned his numerals for lacrosse, but was too busy with his studies to devote time to sports in his later years. A member of Seal and Serpent, Sully has held the position of rushing chairman, steward, and house manager as well as participating in interfraternity football. In his junior year, he was on the Junior Smoker Committee. Upon becoming an engineer, he entered into the competition for THE CORNELL ENGINEER editorial board, and was elected to the Junior Board, and finally last year, associate editor. He is also a member of the Delta Club, a social organization for EE's.

Believing summer work and practical experience to be of great importance, Jack has devoted all of his summer vacations to employment in industry. During the first three summer vacations he was employed by Eastman Kodak Company in Rochester. For the past two summers he has worked for the Rochester Gas and Electric Company as a junior engineer.

At the present time, Sully is very interested in both public utilities and manufacturing work,. Since the draft will affect him, however, he cannot be too sure of his future. His present plans, tentative of course, are to work for a company manufacturing motor control devices for war work, where he feels there is much chance for advancement.

Editor Sullivan

ENGINEER BOARDS . . .

Willard S. Levings

WILLARD Sherburne Levings came to Cornell with the idea of getting an engineering education plus a grounding in business plus a well-rounded college life. Enrolling in the AEME course started him on the way to the first two aims. As for the third, he went out for freshman tennis and for the Freshman Desk Book, but later gave those two up in favor of THE CORNELL ENGINEER, attaining the position of associate editor for this past year. He was a member of the Freshman Advisory Committee in his junior year, and rushing chairman of his fraternity, Theta Chi.

A native of Winnetka, Illinois, Bill worked as a draftsman for a ventillating equipment company in the summer after his freshman year. The factory was air-conditioned, making for a very comfortable summer and perhaps starting Bill on his present interest in air-conditioning. His next vacation was spent as counselor in a boys' camp in Michigan.

In the summer after his junior year, Bill worked as lineman and installer for the Illinois Bell Telephone Co., rehabilitating equipment in one of the worst districts of Chicago. That was a good job, he says, because he had the opportunity of meeting all kinds of people. He tells of many experiences, such as the time an angry executive came running out of an adjoining building, complaining that Bill had just cut off a call to Pittsburgh. Finally the plant manager was called to soothe the irate customer.

Most telephone linesmen prefer not to work in the wealthier sections, according to Bill, because the customers there are the crankiest. He tells of one lady who insisted that the telephone man remove his shoes and don her husband's slippers before entering her home to fix the phone. Strange as it may seem, the greatest fear of the linemen, learned through sad experience, is dogs. The men always whistle before entering a yard to make certain that no dogs are loose therein.

Bill is a sailing enthusiast, and was part owner of a "snipe" which he sailed around Lake Michigan.

He has not yet definitely decided on plans for after college, having in mind sales engineering in the air-conditioning field, telephone installation engineering, or, thirdly, work in the Naval Ordnance Laboratory in Washington.

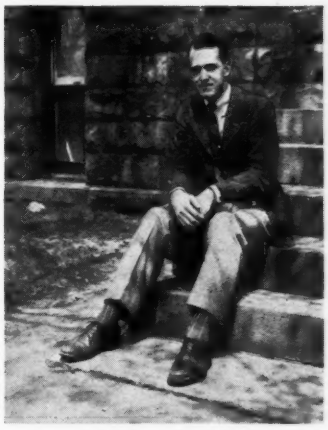
Editor Levings

Thomas M. Wilson

THE retiring assistant editor of the CORNELL ENGINEER, like so many of his fellow students, was influenced in his choice of a school by family ties. That Tom Wilson desired a technical training and a university outlook are major considerations, but the fact that his father, his sister, two uncles, and a number of cousins are Cornellians is not to be overlooked.

During his pre-college years, Tom went through the various phases of creative development — model airplains, model railroads, photography, and finally, radio. He was still highly interested in this field when he came to Cornell, and has maintained his interest since as an Electrical Engineer taking the Communications Option.

Tom joined the ENGINEER staff as a freshman and has been active throughout his four years. He has also been active on the technical staff of radio station WHCU, working some ten or more hours per week in the capacity of control engineer. This job requires him to report at the studios early in the morning—five-thirty, to be exact—and to take his trick at the controls until later in the day. Being control engineer is enjoyable work, but occasionally it has conflicted with the publication of your magazine. More than once, Tom has worked on the ENGINEER dummy until four in the morning and then been on the job downtown at the required time.



Editor Wilson

In addition to his technical training, Tom has two other ambitions. One was to be an organist; this has taken the form of relaxation at the piano "when no one is listening." The other was the ministry. By a very active participation in Westminster Society, which Tom describes as his main extra-curricular interest, he has not slighted this second desire. Last year he was Westminster representative on CU-RW and this year was president of the Society.

In addition to the activities already mentioned, Tom is a member of the Student Engineering Council, representing the ENGINEER. The main function of this body is to put on the Cornell Day Engineering Show. He is a member of the honorary electrical engineering society Eta Kappa Nu, and has served as secretary and vice-president of the national service fraternity Alpha Phi Omega.

CORNELL SOCIETY OF ENGINEERS

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80 Park Place, Newark, N. J.

"The objects of this Society are to promote the welfare of the College of Engineering at Cornell University, its graduates and former students and to establish a closer relationship between the College and the alumni."

President's Message

Fellow Cornellians:

We come again to the end of the cycle, for the changing world brings with it a changing make-up, and there will soon be another group entrusted with the guidance of the Society for another year. In an annual letter which will go to all alumni of the Engineering College a more detailed statement of the interest of the Society for the year is given. It has not been one in which anything exceptional has been accomplished. We have carried on, endeavoring to assist the College in any way possible, to aid the undergraduates in the work they are doing in producing a magazine which has been constantly improving in all departments. Your executive committee has diligently endeavored to maintain the Society on the highest possible standard, and our membership, while not a record one for the Society, is still representative. It should be greater and we hope that a goodly number of the Alumni who read this may find it possible to apply for membership on the blank appended to this letter. Remember the membership fee aids in the production of the magazine, and in other good works for Cornell. The alumni in the metropolitan area, especially, should support the Society; there are large numbers who are not members of the Society.

Previous letters have been confined largely to the future of the engineer, a surely glorious future. In it many things for which the engineer will be responsible will be done. The coming age should be one in which any red-blooded man would want to live. When the war and its destructive efforts are over, a constructive period must begin, and it will be the engineer who will produce the outlets for the stored up enthusiasm which will have been dammed by the narrowing influences of war.

Rym Berry's "Now in My Time", which appears in the Alumni News (one of the outstanding features of the News) often calls to mind thoughts of yesteryear. There was a "My Time" for every engineer who attended Cornell, for he had the privilege of associating with men who have influenced his life, even though he may not yet perceive it. If you will but allow your minds to dwell in the past a bit you will see many things. Some of you will call up the Mogue, an executive genius, sitting in the office in the southwest corner of Lincoln smoking cigarettes continuously; short and curt in his replies; generous in his judgment; yet most sympathetic when sympathy was required. Some will recall his lectures in Sanitary Engineering and Astronomy, and how some co-eds who elected the latter subject badly crimped his style. Then there was Poppy Church, and his entrance into the lecture room with the little black bag full of books, who would begin his lucid demonstrations in applied mechanics by walking to a window and while adjusting it say, "an inch at the top is worth a foot at the bottom." When automobiles were quite young, and State Street was steeper than it is now (at least it seemed so), every morning, rain or shine, snow or sleet, Poppy Crandall could be heard chugging up the hill in his one-lunger, tiller-teered, curved - buggy - dash Oldsmobile, which was parked under Poppy's office window during the day, waiting to chug back to West Hill at night; and before that there was Poppy's bicycle, and I have a photo of that where only the upper part of his body and the handle-bars could be seen on account of the snow banks along East Avenue. Who will forget Poppy and the Junior surveys; how he would hunt out parties who would take siestas in convenient barns when their sections seemed too remote from camp to be worthy of a visit from him? One could write a book on the things which happened under his guidance.

Do you remember the Sibley-Boardman war, culminating in the visit of the Engineers to Dean Finch's noon lecture only to be dismissed summarily (perhaps he thought they were summary proceedings), while the Lawyers who simultaneously visited Bobby Thurston listened for an hour to a lecture which surely made better lawyers of them? Then there was Professor George S .Moler, and the many unique things which he produced with his own hands—the first arc-light machine, one of the first acetylene private-home gas-lighting plants, and later something which seemed remotely capable of any real use, high potential direct current equipment capable of producing 3,000 volts d.c. and upwards with a series of 125 volt generators. What a galaxy of minds there was in Cornell in those days: Johnny Morris, Paddy Ryan, Professor Durand (who stretched his nautical engineering into the laying out of the first two-mile course

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She's a good friend of yours—

The girl behind "the voice with a smile" is known to everyone. You have learned to count on her in daily telephone calls as well as when emergencies come.

Now meet her sister

—also a Bell System girl. She's your friend, too, although you've never heard her voice. Here she is on the final telephone assembly line at one of Western Electric's great plants. Like the fifteen thousand other women in the Company, she does her work well. She's proud of the part she plays in making telephone equipment for this Nation . . . and for the armed forces of the United Nations.

Western Electric

. . . is back of your Bell Telephone service

FOR VICTORY
...keep buying Defense Bonds

THE COLLEGE . . .

(*Continued from page* 13)

stallations from enemy aerial bombardment is the subject of a new course now offered in Buffalo by Cornell University. It is being given under the Engineering, Science, and Management Defense Training program sponsored by the United States office of Education. The course is tuition free.

Since measures of protection against aerial bombardment will be chiefly the responsibility of engineers and architects, enrollment in the course was limited to practicing engineers and architects, members of municipal engineering departments, and engineers charged with industrial plant maintenance.

Engineer Elect

THE retiring Senior Board and the Faculty Advisers take pleasure in announcing the election of the following men to the various boards of THE CORNELL ENGINEER:

Editor-in-Chief
E. Walton Ross, ME '43
Business Manager
Robert H. Flack, ME '43
Managing Editor
Clyde Loughridge, Jr., ME '43

Senior Publication Board: Mircea R. Sfat, ChemE '43, Assistant Editor; Charles H. Barrett AE '43, and John T. Hodges 'ME '43, Associate Editors; Thomas T. Harrow, Jr., CE '43, Treasurer; Morris Bradt, Jr., AE '43, Advertising Manager; Ellsworth F. Filby CE '43, Circulation Manager.

Junior Editorial Board: H. Sherman Burling, Jr., AE '44; Horace F. Ferry, Jr., ME '43; Melvin L. Garritt CE '44; Donald R. Lueder CE '44; Jack H. McMinn, CE '44; Robert S. Rochlin, EE '44; and Gerald R. Schiller, ChemE '45.

Junior Business Board: Thomas A. Dent III, ME '44; David H. Esperson, ME '44; George H. Ficken, ME '44; Martin L. Gleich, CE '44; Kenneth A. Kander, CE '44; and Robert B. Shaad, EE '44.

Sophomore Editorial Staff: William D. Knauss, AE '46; Robert A. Olmstead, CE '45; Harrison Parker, ChemE '46; and Louis L. Williams, III, EE '45.

President's Message

(*Continued from page* 16)

on the east side of the Lake, in which I assisted humbly), Herman Diederichs and his inevitable Mech Lab reports (of which there was a whole library of previous years' reports available for copying), Henry Neely Ogden, a born teacher who could make Descriptive Geometry seem like a novel, Johnny Barr, George Caldwell, and his spectacular demonstration of the unstableness of an iodine compound by exploding it with a touch from a feather attached to the end of a pointer six feet long, Edward L. Nichols, and his wave-length theories, Henry S. Jacoby, and a host of others. It is too bad that the engineers could not have included in their direct recollections Hiram Corson, Benny Ide Wheeler, Moses Coit Tyler, George Lincoln Burr, Goldwin Smith, H. Morse Stevens —some day perhaps the cultural values will be deemed to be of equal importance, at least, with the more prosaic scientific details. They might even supersede them. What recollections these names and others

(*Continued on page* 22)

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Real Property

(*Continued from page* 7)

to find an iron pin marking an essential corner of the property; and after uncovering a considerable area to a depth of three feet without success, he decided it was useless to spend any more time and located the point by distances and angles from adjacent corners. In order to construct boxing for the pouring of a new concrete monument, laborers went down about six inches further and found the old iron pin almost exactly where the new point had been set. Upon another occasion while searching for a stone monument marking railroad right of way, it was found that the tracks had been raised on cinder fill above the original swampy ground. After digging down about two feet in what we hoped was the correct location, some planking was encountered. When this was uncovered it proved to be the top of a narrow well made of timber, and at the bottom of the well some eight feet below the surface was the "lost" monument. Someone had had the right idea about preserving the mark but had not carried it out in a very practical manner.

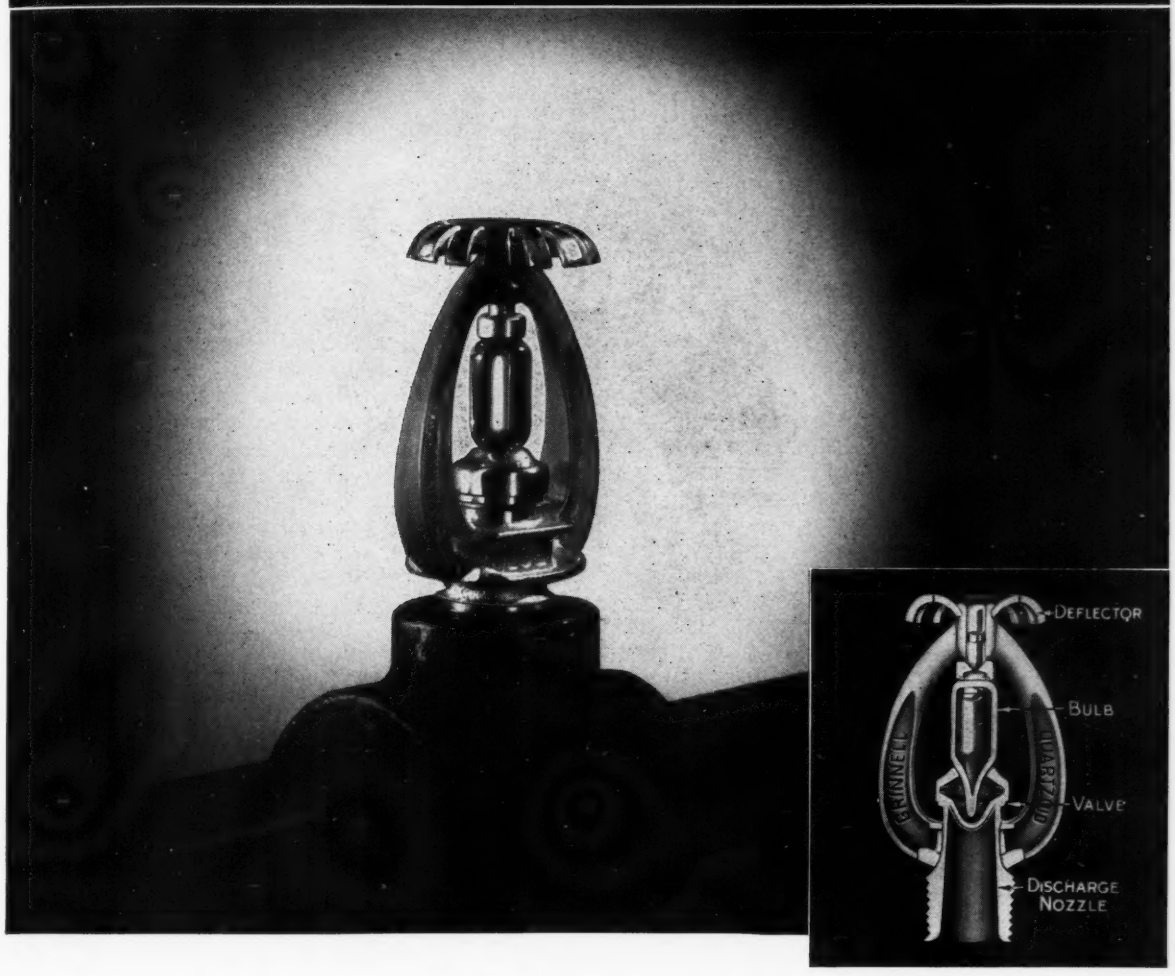
Fence lines are always significant in retracing boundary lines as they usually represent the intention of the adjoining parties as to their common boundaries. In cases where the fence was built many years before, the only evidence may be the stumps of old posts or perhaps rotted pieces of rail lying on the ground. In one case which aroused my imagination and respect, a surveyor was searching for a very old rail fence that once marked a boundary line. As the survey was in well timbered land, pieces of rotted wood were not convincing evidence. By kicking around among the leaves, however, he found pairs of flat stones set in the familiar zigzag pattern of the old rail fence, the stones having been used to keep the lowest rail off the ground. This was a perfectly good basis for retracing the old boundary.

When the surveyor is attempting to establish and confirm existing boundary lines, all facts and evidence which in any way might form a clue must be investigated and studied. If the evidence proves to be conflicting or insufficient, it may be necessary to leave the final decision to the courts, where the surveyor appears as an expert witness. The courts have set up general rules of construction in the weighing of the various forms of evidence, the usual order of preference being (1) natural objects such as trees, streams and roads; (2) artificials objects such as iron pipes, stone monuments or even wood stakes; (3) calls for adjoiners, which means the limits of neighboring ownership; (4) the courses and distances prescribed in the deed; and (5) the area called for in the deed.

As a final comment some emphasis should be placed on the value of maps or plates in supplementing and clarifying deed descriptions. A well drawn map will include all

(*Continued on page* 22)

The little glass fireman that draws no pay...



TAKE a good look at this picture. For without a ladder you seldom get a close-up of a sprinkler head.

This one is said to be the last word—so reliable that industries which equip their buildings with this little "fireman" obtain low insurance rates. Users say it pays for itself.

When the heat of a fire reaches a certain temperature, the little "Quartzoid" bulb you see in the sprinkler head is shattered by expanding liquid inside it. A valve is thus released, and water is directed onto the fire.

For the engineer, there's more to that little bulb than meets the eye. For one thing, it replaces alloys formerly used. For another, it shows how glass can now be made into accurate mechanical parts. The bulb must shatter at a specific temperature. And it must shatter completely, with no splinters to hinder valve action. Too, it must fit its hardware exactly. So it's up to Corning to supply glass free from weakening flaws and to hold wall thickness and O.D. to the small tolerances that can make or break the efficiency of a sprinkler head.

Fussy? Sure. But fussy and tough jobs are stock in trade at Corning. Did you know for instance that Corning makes a light globe that also protects industry because, unlike the "Quartzoid" bulb, it will *not* shatter? That Corning has developed industrial glasses to withstand heat that turns metals to liquid? Or that glass springs from Corning will outlast metals in fatigue tests?

These few examples give you an inkling of the growing usefulness of glass in these days of material shortages. No wonder engineers with urgent problems say "Ask Corning." Corning Glass Works, Corning, N.Y.

CORNING
means
Research in Glass

Real Property

(*Continued from page* 20

pertinent distances, bearings and angles, the kind and location of monuments, names of adjoining owners, true or magnetic meridian, scale, and any other information necessary for a complete description and identification of the tract. While it is not as a rule essential that a map accompany the deed (in some jurisdictions there are statutes requiring the filing of subdivision maps), it is always a wise precaution to prepare one, as it gives owners and other persons a much clearer and more definite idea of the property. In fact some engineers have advocated the radical departure of using a map *instead* of a deed description to identify and describe the granted lands.

The foregoing treatment of the whole subject of real property and its measurement is necessarily brief, and many rules and practices have been omitted or merely mentioned. It is hoped, however, that enough has been said to direct attention and thought to one of the most vitally important institutions of our modern life and to a field that a multitude of civil engineers have found to be at times puzzling, but always interesting.

President's Message

(*Continued from page* 18)

conjure up. Truly it was good to have been there in that time.

And so when we come to the end of the year, it is fitting that we reflect thus briefly on some of the influences which have led to the opportunities of today. If we did not take advantage of these contacts, we are to blame; if we thought some were too rigorous, perhaps in retrospect we may wonder why they were so lenient; if we find ourselves today looking backward, we are but paying due homage. Yes, there was a "My Time" and it will always be "THE" time. Those who have just begun their lives, and those who are but a short time on the way, should stop and ponder a bit over "their" times, and be refreshed.

ENGAGEMENT

Mr. and Mrs. Robert J. Wright, of 856 Hoffman Street, Elmira, N. Y., announce the engagement of their daughter to Ernest S. Walker, Jr., son of Mr. and Mrs. E. S. Walker, 17 Orchard Street, Waverly, N. Y.

Miss Wright is a graduate of Elmira schools and Elmira College, class of '41 and at present is a member of the faculty of North Collins High School.

Mr. Walker is a graduate of Waverly schools and of Riverside Military Academy, Gainesville, Ga. and Hollywood, Fla. He is a member of the class of '42 in Cornell University where he is studying civil engineering. While at Cornell Mr. Walker has been active as circulation manager of The Cornell Engineer and has been elected to Pyramid, national honorary engineering society. After June 1, Mr. Walker will be employed as Junior Civil Engineer with the Tennessee Valley Authority in Chattanooga, Tenn.

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But the stainless steels are only one great contribution of chromium. This element has also helped to provide hard, shock-resistant armor plate and armor-piercing projectiles; long-wearing engine valves; strong, tough gears, tools, ball bearings, car trucks, shafts, springs, and dies; and hundreds of other improved articles.

We do not make steel of any kind. But for over 35 years, we have made ferro-alloys and alloying metals used in steelmaking. Among these are chromium, silicon, manganese, vanadium, tungsten, zirconium, columbium, and calcium.

It was our research and development that made the low-carbon grades of ferro-chromium available commercially. Without these, production of a majority of the stainless steels would have been impracticable. Inquiries about stainless and other alloy steels — their manufacture, fabrication, and use — are cordially invited.

The progress made by Electro Metallurgical Company in the manufacture and use of ferro-alloys and in the development of alloy steels has been greatly facilitated by metallurgical research in the laboratories of Electro Metallurgical Company and Union Carbide Company; by the advances in electric furnace electrodes and techniques of National Carbon Company, Inc.; and by the broad experience in the production, fabrication, and treatment of metals of Haynes Stellite Company and The Linde Air Products Company. All of these companies are Units of Union Carbide and Carbon Corporation.

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STRESS and STRAIN...

The man had just saved the little boy from drowning and was being questioned by the boy's parent. "Are you the man who saved little John from drowning?" "Yes I am." "Well where the hell is his hat?"

* * *

And then there is the follow who walked into a bar optimistically and left misty optically.

* * *

Recently we heard of a secretary with a passion for details and exactness. It seems her boss died very suddenly and left an important business letter unmailed. Before posting it the secretary added the following explanatory note below her employer's signature: "Since writing the above I have just died."

* * *

Doctor, to young lady: "My dear all you need is a little sun and air."

Young lady: "Why doctor how can you say that, I'm not even married yet."

* * *

Custom's officer, (finding a bottle of whiskey): "I thought you said you had nothing but old clothes in this bag?"

Tourist: "And I was right. That's my nightcap."

* * *

She: Does it make any difference which side of you I sit on?

He: No, I'm ambidextrous.

—Cut Courtesy Excavating Engineer

"He's been treating the men just like dirt!"

The man who said one picture was worth ten thousand words must have been trying to describe a corkscrew.

* * *

Joe: Did you say your girl's legs were without equal?

Jack: No, I said they were without parallel.

* * *

Our grandmothers believed that there was a destiny that shapes our ends, but the modern girl places more faith in girdles.

* * *

John: Care to buy a nice letter opener?

Sam: No thanks, I'm married.

* * *

He took her gently in his arms
And he pressed her to his breast
The lovely color left her face
And lodged on his full dress.

* * *

Definitions

Bachelor: No children to speak of.

Gigolo: Lemon squeezer.

Pedestrian: A man with two cars and a wife and son.

Teawagon: A pushcart that broke into society.

A gullible man: One who knows his daughter has been a good girl because she came back from her trip with a Gideon bible in her suitcase.

* * *

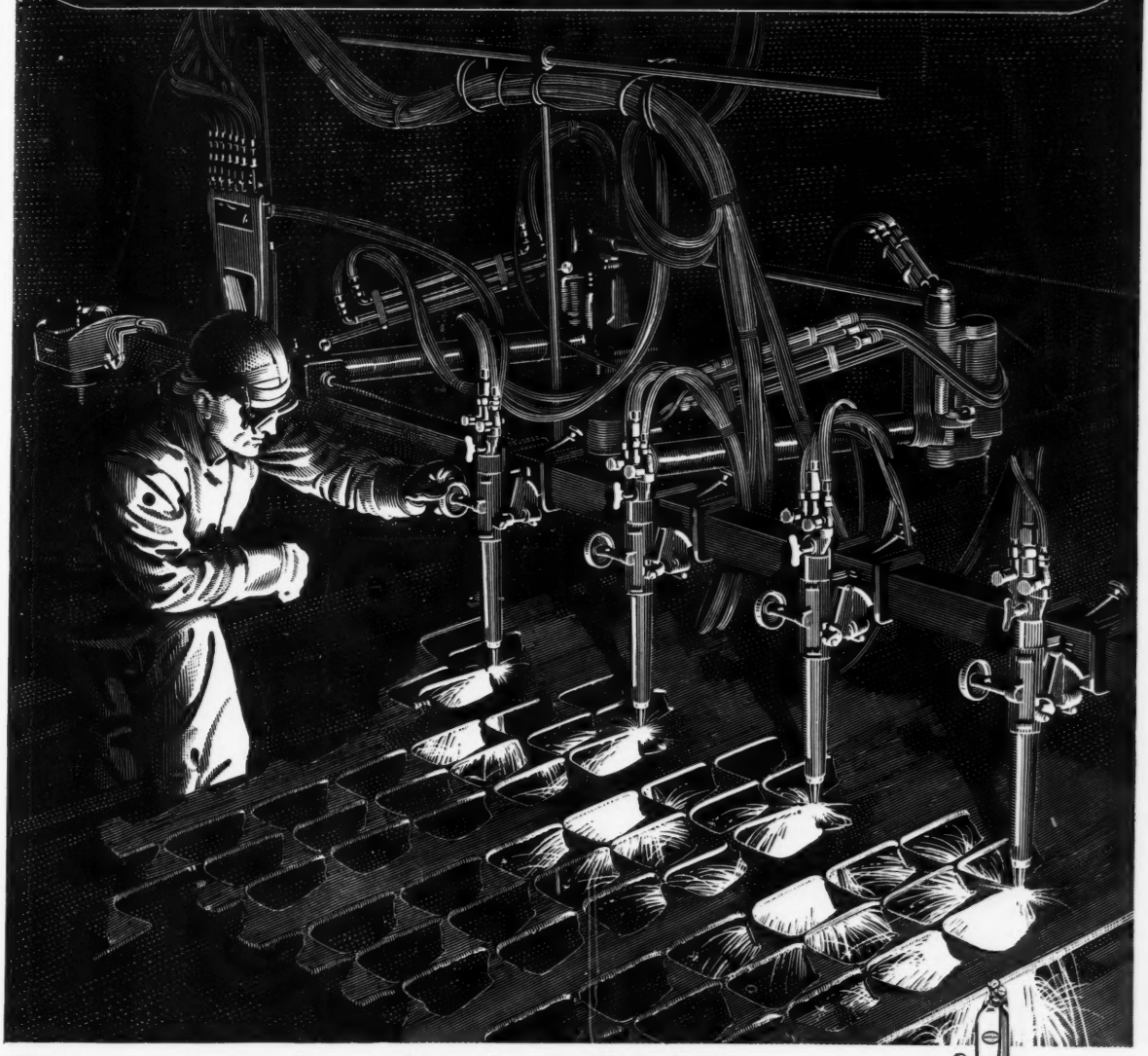
Landlord (to prospective tenant) "You know we keep it very quiet and orderly here. Do you have any children?"

"No."

"Do you play any musical instruments? Do you have a dog or a parrot?"

"No but my fountain pen scratches a little some times."

FLAMES ARE THE CUTTING TOOLS



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G-E Campus News

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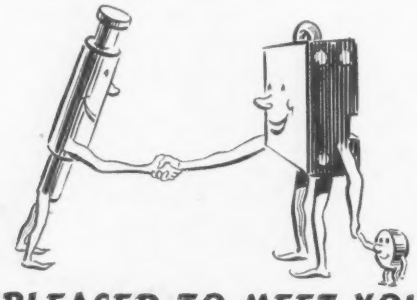
GENERAL ELECTRIC'S Radio and Television Department, in its new Radio News Program with Frazier Hunt, is telling the story of electronics to a nation at war—a war in which electronics itself is one of our most powerful tools.

For electronics—the youthful science that embraces all the varied applications of electron tubes—is going into war not only on the front, but behind the front, where it is today revolutionizing many industrial practices.

Unique about this thrice-weekly broadcast (Tuesday, Thursday, and Saturday) is the fact that G.E. is using an electronic device, radio, to carry the story of electronics to America.

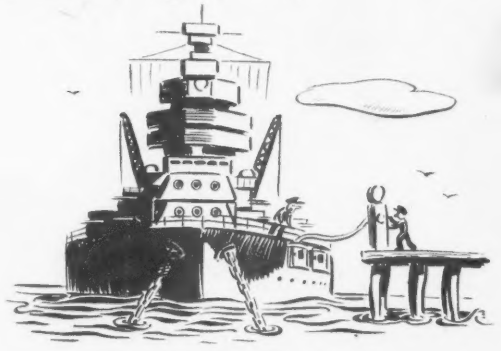
In addition to 51 stations of the Columbia Broadcasting System, G.E. is using the first network of FM stations ever to carry a regular series of broadcasts.



"PLEASED TO MEET YOU"

IT USED to take General Electric 18 months to build one of the great 275-ton machines that cut low-speed gears for cargo-ship propulsion sets. Today that time has been halved by farming out the construction of parts to dozens of subcontractors.

Major parts of the machines come together for assembly from 12 separate subcontractors in five states; miscellaneous smaller parts come from 38 firms in seven states. Jobs of casting, annealing, and machining involve, besides foundries and steel companies, a Navy yard, shipbuilding yards, a locomotive company, and a maker of steel safes. Co-ordinating and checking all these widespread activities is a major achievement in itself, since the finished machine has to be precise enough to cut gears with an accuracy of 3/10,000 inch.



"FILL HER UP!"

BECAUSE the ocean isn't equipped with filling stations every few miles, naval vessels must carry enough fuel for long voyages. And because finding storage room aboard for this fuel is a serious design problem, anything which cuts down fuel consumption is a great advantage.

Most naval ships today are driven by steam turbines connected to the propeller shafts, through reduction gears. And turbine engineers, working with the Navy, have pioneered in the use of higher steam pressures and temperatures—producing turbines of such improved efficiency that in modern ships the fuel consumption per horsepower is from 25 to 40 per cent lower than in vessels of the same type used during the first World War. Thus it has been possible to design ships with greater cruising radius for the same amount of fuel oil, or with more armor and guns for the same over-all weight of the ship.

GENERAL ELECTRIC

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